Historic, Archive Document

Do not assume content reflects current
scientific knowledge, policies, or practices.

SHOUT
SHARE
IT

aSB763
.A165453
c.2

Southwestern Forest Insect & Disease Bulletin

U.S.D.A.
AGRIC LIBRARY
RECEIVED
SERIALS CONTROL AND
EXCHANGE SECT
CURRENT SERIAL RECORDS

SOUTHWESTERN REGION
U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

Vol. 3 January 1973 No. 1

Forest Insect & Disease Conditions - 1972

This issue of the bulletin is a report of Southwestern forest insect and disease conditions in 1972. The report was compiled by the Forest Service Insect and Disease Management Branch from information supplied by both Federal and State agencies.

SOUTHWESTERN STATES (R-3)[1/]

1/ Includes all forested lands in Arizona and New Mexico and National Park Service land in western Texas.

By Charles J. Germain, Melvyn J. Weiss,

and Robert C. Loomis

Division of Timber Management

Albuquerque, N. Mex.

Conditions in Brief

Disease problems receiving the greatest attention in 1972 were dwarf mistletoes and air pollution. Bark beetles were active in ponderosa pine, Douglas-fir, and Engelmann spruce stands. Significant increases in defoliator activity were noted throughout the Region. Weather was a factor in the increased insect activity.

Drought, windstorms, and hail damage were major environmental factors affecting the insect situation in the Southwest. Forest stands of all types were severely drought-stressed. Both bark beetles and defoliators, responding to reduced tree vigor and declining biotic restraints, showed increased activity. Fall windstorms on the Fort Apache Indian Reservation and Kaibab National Forest, in the Douglas-fir and Engelmann spruce types, provided an ample food supply for bark beetles. Numerous areas of severe hail damage were noted throughout the Region this year. Many trees were completely stripped of their foliage. These areas are being closely watched for a possible bark beetle buildup.

Douglas-fir beetle damage has increased noticeably on National Forest and Park Service land in Arizona, and on the Navajo Indian Reservation in New Mexico. The roundheaded pine beetle epidemic in New Mexico, on the Lincoln National Forest and Mescalero-Apache Indian Reservation, is spreading northward into the Capitan Mountains. Spruce beetle populations on the Fort Apache Indian Reservation, Ariz., are static. Populations in New Mexico remained at a low level.

Activity of defoliators is significant this year throughout the Region. White-fir needle miner has become active at two locations in Arizona. Defoliation by the western tent caterpillar continued on National Forest and private lands in northern New Mexico. The infestation of this pest near Tucson, Ariz., has declined. Douglas-fir tussock moth activity in Arizona is low. Defoliation by this pest occurred on ornamental spruce and fir trees at Los Alamos, N. Mex. The southwestern pine tip moth continued to damage ponderosa pine reproduction in Arizona. Populations of the western spruce budworm are low.

The most important disease agents were the dwarf mistletoes. Emphasis was given to application of dwarf mistletoe preventive measures in the management of timber stands. Considerable emphasis was also placed on evaluating air pollution injury to forest vegetation. A Regionwide detection survey was conducted to determine both the extent of air pollution injury near existing sources, and the potential for injury in areas where new sources will be built in the near future.

Status of Insects

Douglas-fir beetle, Dendroctonus pseudotsugae Hopk., populations increased sharply this year. An abundant food source from wind-thrown Douglas-fir and weakened, drought-stressed host trees are the primary causes for the increase.

Several locations in Arizona showed increasing beetle activity this year. Approximately 500 trees were found infested with Douglas-fir beetle on the North Rim of Grand Canyon National Park. Groups of infested trees were also spotted from the air on the adjacent Kaibab National Forest.

In addition to the outbreak, an extensive blowdown, covering 2,000 acres of mixed conifer type, occurred in October on the Kaibab National Forest. Salvage logging of the down material is planned to reduce the possibility of a major outbreak.

A small pocket of beetle-infested Douglas-fir trees was found near the nature trail at the Walnut Canyon National Monument. National Park Service and Forest Service personnel were successful in suppressing the population in the infested trees. Ethylene dibromide was used to treat the infested trees. The 400 acres of susceptible host type within the Monument has incurred several beetle population flare-ups in the past.

Scattered Douglas-fir beetle damage has appeared on the Apache National Forest, south of Alpine, Ariz. Infested trees are located within and adjacent to cutting areas, and salvage logging is anticipated as an economical means of control.

Douglas-fir beetle activity was also noted in the Chuska Mountains near Washington Pass. No other Douglas-fir beetle problems exist in New Mexico.

Spruce beetle, Dendroctonus rufipennis (Kby.). The Fort Apache Indian Reservation, near Whiteriver, Ariz., has the only active spruce beetle epidemic within the Region. Analysis of a biological evaluation, conducted on 15,000 acres this year, showed the infestation trend to be static to decreasing. Spruce trees on the Reservation were hit with strong winds during the fall of 1971. Wind-thrown spruce averaged one tree per acre. The majority of these stems were infested. There is no indication that the infested stems will harbor enough brood to cause future damage to standing trees. The impact that this epidemic has had on resource uses and values of the spruce-fir forest is being studied by Region 3 in cooperation with the Bureau of Indian Affairs.

Spruce beetle populations at all other locations in Arizona are at an endemic level. Activity is also at a low level at all centers in New Mexico. Natural factors have been primarily responsible for the decline.

Spruce beetle survey crew uses variable plot technique to gather information concerning stand structure and insect damage.

Severe hailstorms stripped vegetation in many areas throughout the Region.

A cooperative study between Regions 2, 3, and the Rocky Mountain Forest and Range Experiment Station was initiated this fall at Encampment, Wyo. The study involved a post-attack treatment of standing infested Engelmann spruce trees with four different dosage strengths of cacodylic acid. Results of this study, showing the most effective dosage, will be available following the 1973 sampling.

Roundheaded pine beetle, Dendroctonus adjunctus Blandf., populations remained heavy on the Lincoln National Forest and adjacent Mescalero-Apache Indian Reservation in southern New Mexico. The infestation has spread to the northern limit of the ponderosa pine type in that area, the Capitan Mountains. Many newly-faded trees were evident during this year's aerial survey on both National Forest and Indian land, and the infestation presently totals 150,000 acres. The problem is felt to be primarily one of an overstocked stand with poor vigor. Plots have been established throughout the infestation to measure the effect of the beetle on the tree resource.

At Riggs Lake, on the Coronado National Forest, near Safford, Ariz., chemical control completed in 1971 was successful in reducing a roundheaded pine beetle population. A post-suppression evaluation conducted in May 1972 showed no newly infested ponderosa pine trees.

Ips beetles, Ips spp., activity increased in all forested areas in 1972. Much of the impetus for the increase was the extremely dry spring weather. In several areas, increased activity was associated with a continuous accumulation of logging and thinning slash.

Tent caterpillars, Malacosoma spp. Heavy defoliation by the western tent caterpillar, M. californicum (Pack.), continued in northern New Mexico, near Chama, and adjacent southern Colorado. The infestation now covers 8,000 acres of aspen on both private and National Forest lands. Caterpillar larvae on the tracks of the Cumbres and Toltec Scenic Narrow-gage Railroad again created a slippery condition, forcing the train to a temporary halt on the steeper sections of the route. Excessive defoliation over the last few years has been of major concern to landowners since the altered habitat has reduced the big game food supply.

White-fir needle miner, Epinotia meritana Hein., is epidemic on 6,000 acres of white fir on the Apache National Forest near Alpine, Ariz. Forty study plots were established within the infestation to measure the effects of the needle miner on the forest resource. Analysis of the plot data showed defoliation within the current outbreak averaged 60 percent of the tree crown. Some white fir top-kill and mortality is expected. Since white fir has recently become a valuable source of lumber in the Region, the needle miner infestation could become an important economic problem if large-scale tree mortality should develop.

Western spruce budworm, Choristoneura occidentalis Free. The Eagle Nest Unit in northern New Mexico is the only area where the pest showed increased activity. Samples taken within the infested area showed defoliation as high as 17 percent of the tree crown and up to 5.6 new egg masses per 1,000 square inches of foliage. Populations at all other centers in the Region were endemic and static.

Southwestern pine tip moth, Rhyacionia neomexicana (Dyar). Moderate populations of this pest on 100,000 acres of the Sitgreaves National Forest, south of Winslow, Ariz., remained static. A cooperative study between Region 3 and the Rocky Mountain Forest and Range Experiment Station was initiated this year in the infested area. The study, which covers 100 acres, involves the use of a female pheromone to trap male moths.

Other insects. Douglas-fir tussock moth, Hemerocampa pseudotsugata McD., caused damage to ornamental spruce and fir trees in Los Alamos County, N. Mex. Tussock moth activity at other centers in New Mexico and Arizona is at a low level. Populations of a moth, Ctenucha sp., a grass feeder, were heavy on the Coconino National Forest, Ariz. Activity of the pinyon needle scale, Matsucoccus acalyptus Herb., is static in the Region. Prescott scale, Matuscoccus vexillorum Morr., caused damage to ponderosa pine in Los Alamos, N. Mex., and adjacent Santa Fe National Forest. A needle miner, Coleotechnites sp., damaged ponderosa pine trees near Flagstaff, Ariz. An unidentified Noctuid moth defoliated box elder trees at Bandelier National Monument and on the Cibola National Forest near Albuquerque, N. Mex. Scarabaeid beetles, Dichelonyx sp., damaged Douglas-fir trees on the Santa Fe National Forest, N. Mex. Large numbers of several species of cicadas were noted throughout the Region this year. No apparent economical damage was caused by the cicadas.

Status of Diseases

Dwarf mistletoes, Arceuthobium spp., are the most widespread and destructive disease-causing agents in the forest lands of the Southwest. Of the nine dwarf mistletoes that occur in this area, Southwestern dwarf mistletoe, Arceuthobium vaginatum subsp. cryptopodum (Engelm.) Hawks. and Wiens, which occurs on ponderosa pine and Apache pine, is the most important. Douglas-fir dwarf mistletoe, A. douglasii Engelm., on Douglas-fir, is next in importance. The seven other dwarf mistletoes that occur in the Southwest are of local importance. Annual losses caused by A. vaginatum subsp. cryptopodum may exceed 150 million board feet.

Emphasis in 1972 was again placed on applying dwarf mistletoe preventive practices during cultural stand treatments. Preventive practices included removal of residual infected trees from regeneration areas and harvest of poor-risk infected trees. These practices were carried out over an estimated 56,000 acres during the year.

During 1972, first use was made of a simulation program for predicting yields in dwarf mistletoe-infested ponderosa pine stands. The program, which was recently developed by the Rocky Mountain Forest and Range Experiment Station for use in the Southwest, is expected to be a valuable aid in making control decisions.

Air pollution. In 1972, a Regionwide detection survey was again conducted for air pollution-caused forest diseases. Forty-seven areas in National Parks and Monuments, National Forests, Indian Reservations, Bureau of Land Management land, and private land were surveyed. Individual survey areas were located near major, existing sources of atmospheric contamination, and in areas where major sources will exist in the near future.

Trees and associated vegetation in the surveyed areas were either examined for symptoms of acute sulfur dioxide injury or for symptoms which might later be confused with sulfur dioxide injury. Symptoms of acute sulfur dioxide injury were observed up to 7 miles away from copper smelters at Miami, Morenci, and San Manuel, Ariz. These symptoms were noted on Bureau of Land Management and private lands, as well as the Tonto, Apache, and Coronado National Forests. Foliage injury was most evident[2/]

2/ 66% or more of the leaf area killed on an individual tree or plant on 66% or more of the total trees or plants of that species in the survey area.

---

close to the smelters at Miami and Morenci. In the other areas, foliage injury was limited to a few sensitive plants.

Observations made during surveys conducted in the past 2 years suggest that acute sulfur dioxide injury is probably confined to mesic areas within 10 miles of air contamination sources. Future surveys will focus primarily on areas where injury is occurring, and on areas where new sources are expected in the near future.

A cooperative study with the University of Arizona is now underway which will determine symptomatology and relative susceptibility of selected southwestern forest tree and plant species. Results of this study will increase the effectiveness of current air pollution surveys.

Root disease. Preliminary investigation indicated that Fomes applanatus (Pers. ex S. F. Gray) Gill is associated with windthrow of aspen in a recreation area on the Carson National Forest. An evaluation of this problem will be conducted in 1973.

Armillaria root rot, Armillaria mellea (Vahl.) Quel., continued to cause mortality in a 10-year-old ponderosa pine plantation on the Santa Fe National Forest. Mortality in the plantation was about 6 percent in 1972.

Rusts. Limb rust, Peridermium filamentosum Pk., continued to cause some mortality in ponderosa pine. Spruce broom rust, Chrysomyxa arctostaphyli Diet., and fir broom rust, Melampsorella caryophyllacearum Schroet., are important in several recreation areas where they are associated with bole deformation, spiketop, and mortality. No direct control is being undertaken for diseases of this type. Land managers are encouraged to reduce losses by removing poor-risk trees during normal intermediate cuttings.

A scouting survey was conducted in north central Arizona and north central New Mexico to determine if long-range spread of white pine blister rust, Cronartium ribicola Fischer, had occurred. No evidence of this disease was found on either white pine or ribes.

A leaf rust disease defoliated aspen on approximately 5,120 acres of the Lincoln National Forest. A detection survey will be conducted next year to note the progress of this foliage disease.

Needle cast. Needle cast of ponderosa pine was at an endemic level in 1972. The three needle cast fungi, which have been associated with spectacular damage in the past, are Elytroderma deformans (Weir) Dark., Davisomycella ponderosae (Staley) Dublin, and Lophodermella cerina (Dark.) Dark. A 31-year-old ponderosa pine plantation on the Lincoln National Forest, that was severely defoliated by L. cerina in 1967 and 1968, suffered little permanent damage. Twenty-eight trees on a permanent plot in the plantation were re-examined in 1972. Twenty-three of these trees had regained a full complement of foliage. The other five had died, but the cause of death could not be determined.

Winter injury. Pinyon pine on the Cibola National Forest that were injured by cold weather in January 1971 have not recovered. One hundred trees on three permanent plots were re-examined in 1972. Forty of the trees had suffered 50 percent or greater branch mortality. Three had died, apparently from the combined effects of cold injury and drought.

REMEMBER - PEST DETECTION IS FOR YOUR PROTECTION

Be alert! Please report promptly any new or unusual forest insect or disease outbreaks to the Forest Service Branch of Forest Insect and Disease Management. Information concerning forest pest problems can most easily be reported on the Detection Report Form (R-3 5200-5). A sample of this Detection Report Form is shown on page 18. If you need additional information or forms, please write or give us a call at (505) 843-2440.

USDA—Forest Service

DETECTION REPORT

FOREST INSECT AND DISEASE DAMAGE

INSTRUCTIONS: After detection of any insect or disease activity, do the following:

(a) Immediately prepare detection report in triplicate.
(b) Send all three copies to the Regional Forester, Forest Service, USDA, 517 Gold Avenue, S.W., Albuquerque, New Mexico 87101.
(c) Pest Control will acknowledge, answer, and return your file copies.

PEST DETECTION IS FOR YOUR PROTECTION

Be alert. Report promptly any new or unusual forest pest to the Regional Forester (See FSM 5220).

Pest Control Branch USFS

Administrative Unit _____ (Forest, National Park, etc.)

Sub-Unit _____ (Ranger District, etc.)

Date of Observation _____

Observed by _____

Location of Damage (Attach ¼" scale map)

_____

_____

GENERAL INFORMATION

Host _____ Avg. d.b.h. _____

Size class affected:

- ☐ Seedlings
- ☐ Saplings
- ☐ Poles
- ☐ Sawtimber
- ☐ Overmature timber

Damaged standing stems/acre _____

Down stems/acre _____ (Blowdown, slash, cull, etc.)

Number of acres infested _____

Damage to:

- ☐ Single Trees
- ☐ Groups _____ (No. of) _____ (No. per)

TREE DAMAGE SYMPTOMS—(Check term(s) applicable)

Crown:
- ☐ Top
- ☐ Middle
- ☐ Lower
- ☐ Entire

Needles or leaves:
- ☐ Chewed
- ☐ Mined
- ☐ Webbed
- ☐ Spotted
- ☐ Discolored
- ☐ Missing

Tree foliage:
- ☐ Green
- ☐ Fading
- ☐ Sorrel
- ☐ Red
- ☐ Brown
- ☐ Black

Enclosures:
- ▱ Appropriate Maps
- ▱ Damage Samples
- ▱ Insect Specimens

Damage to:
- ☐ New Foliage
- ☐ Old Foliage
- ☐ Both

Tree bole:
- ☐ Cracked
- ☐ Sluffed bark
- ☐ Boring dust
- ☐ Pitch tubes
- ☐ Woodpecker feeding
- ☐ Canker
- ☐ Conks

Branches:
- ☐ Broken
- ☐ Swollen
- ☐ Discolored
- ☐ Cankers
- ☐ Mistletoe
- ☐ Girdled

Associated disturbance:
- ☐ Fire
- ☐ Logging
- ☐ Thinning
- ☐ Blowdown
- ☐ Insects
- ☐ Disease

Unusual weather conditions:
- ☐ Wind
- ☐ Rain
- ☐ Hail
- ☐ Sleet
- ☐ Snow
- ☐ Flood
- ☐ Drought

INFESTATION OR INFECTION CHARACTERISTICS

Insect(s) or Disease(s) if known _____ How long active _____

Status: Static _____ Decreasing _____ Increasing _____ Unknown _____

Remarks: _____

(FOR PEST CONTROL BRANCH USE ONLY)

Remarks:

Unisort Cards By _____ Date _____ Acknowledged By _____

R-3 5200-5 (Rev. 1/69)

FORESTS INSECT AND DISEASE MANAGEMENT

ARIZONA, NEW MEXICO, W. OKLAHOMA AND W. TEXAS

U.S. DEPARTMENT OF AGRICULTURE, FOREST SERVICE, SOUTHWESTERN REGION

Additional information concerning this report or other forest insect and disease problems can be obtained by contacting the Forest Insect and Disease Management Branch listed below.

USDA, Forest Service
Division of Timber Management
Branch of Forest Insect and Disease Management
517 Gold Avenue, SW
Albuquerque, New Mexico 87101

Telephone: (505) 843-2440